

REMARKS

To facilitate Examiner's reconsideration, the original claims have been extensively revised to avoid typographical errors, and present antecedent for various terms.

Relative to the drawings, a new Figure 8 is submitted labeled "replacement sheet". A new Abstract is also presented, which is believed to comply with MPEP Section 608.01.

Claim Rejections, 35 U.S.C., Section 112

Examiner has rejected claims 1 to 4 and 6 to 8 under Section 112, second paragraph, as being indefinite.

With respect to claim 1, Examiner has stated that "means for controlling ... said predetermined path" is vague and indefinite, inquiring as to what structure is being claimed by the means plus function in the structure. With respect to claim 1, lines 8 to 10, "electronic controller feedback means driven by rotation of said spool for generating a digital position reference signal to said controller feedback" is vague and indefinite. He has inquired as to how does the controller generate a digital reference signal to itself; how does the rotation of the spool drive the electronic controller feedback means, and what disclosed structure is being referred to by the means plus function?

In response, Examiner is invited to reread Applicant's disclosure, particularly that of Figure 3 and elements 15, 16, 17, 18, and 19. Reference is also made to Applicant's disclosure, page 5, lines 18, et seq., page 8, lines 18, et seq., to page 9, line 3. It is appreciated that understanding the present disclosure, as well as the art relied upon by Examiner requires substantial sophistication.

With respect to claims 6, lines 5-8, Examiner has stated, "a master control block" controlling the angular direction, velocity and position ... logic blocks for determining the direction of rotation of said motor means" is vague and indefinite. Examiner states that the master control block and logic blocks are being interpreted as a means plus function, because the master control blocks are being described with only functional language and no structure. Examiner has inquired as to what disclosed

structure is being referred to by the phrase "master control block" and "logic blocks", and where these blocks are shown.

In response, Examiner's attention is invited to Figures 5, 6, and 7 and the accompanying description of the same in the specification. This structure is described in terms of function, and, as mentioned, the construction of operable software and hardware is within the skill of the art.

Examiner has also stated that claims 6 to 8 are replete with Section 112, second paragraph objections, and it is partially for this reason that the original claims have been canceled, to be replaced by the newly inserted claims, which include correction of typographical errors.

Claim Rejections - 35 U.S.C. Section 103

Relative to the merits of the application, Examiner has rejected Claims 1 to 2 and 6 to 8 under Section 103(a) as being unpatentable over Hebberling, in view of Kotzur, et al. (5,678,778). Examiner has explained that Hebberling discloses a device for transversing a linear flexible product, including a pivotally-mounted traverse arm 38, a rotating motor (10), and a link (12, 29, 17, 32, 33, 34) interconnecting a point on a rotating part of said motor (10) with a point on said traverse arm (38) and means (not shown) for controlling rotation of said motor through arcuate sectors of 180 degrees and less to make up 360 degree rotations, at a constant speed such that a free end of said traverse arm (38) moves at a substantially uniform rate of traverse over a traverse path.

In response, it is submitted that the known art including the above structure is recited in the preamble of the claims, and the improvement is separately recited.

Applicant's understanding of Hebberling is that he does not disclose substantially uniform traverse, but rather, modifies a sine wave movement so that it is closer to uniform traverse, to result in being able to spool the product at a very high rate of speed. It is noted that Hebberling uses only a single motor, and accomplishes all of his adjustments entirely through mechanical means, including a mechanical differential. It is difficult to imagine how he controls rotation of the motor. Rather, he runs the motor at a constant speed and modifies the output of the motor mechanically as the arm traverses in accordance with fixed cam profiles.

Examiner admits that Hebberling does not disclose an electronic controller feedback means driven by the spool, and a process control device selecting ratio and <sup>position</sup> ~~pattern~~ criteria. However, he states that Kotzur, et. al. (778) teach a winding apparatus, including a separate motor (51) for driving a traverse device, a motor (66) for rotating the spool (44) with a feedback means (68) driven by rotation of the spool (44) and an electronic controller (Figure 13c) to determine the winding to define a ratio between the traverse motor means (51) and said spool motor means (66), algorithms, which are adjustable with the process control device (202). Examiner concludes that it would have been obvious to one of ordinary skill in the art to provide Hebberling with a detecting and control system as taught by Kotzur (778) to control and change the winding ratio between the traverse and winding spool as taught by Kotzur.

With respect to claims 6 to 8, Examiner states that Kotzur teaches an encoder to provide information as to the position of the traverse guide to the microprocessor, direction of the arm winding and able to stop manually, able to send signals from the motor to determine the speed of rotation, and the cam box converts angular displacement, angular velocity, and angular acceleration (on pages 5-7 and Figures 13a-c).

Applicant has reviewed the Kotzur specification carefully. His principal disclosure relative to Examiner's argument appears in column 16, lines 1 through 36.

It is submitted that a viable Section 103 rejection must include a modified reference structure in which the principal reference discloses the bulk of the claimed structure, with the supplemental references modifying parts of the principal reference.

As explained above, Hebberling employs only a single motor, and control of the traverse arm is solely by means of mechanical camming and motion modification means, including solely mechanical elements. It is submitted that there is no motivation in Hebberling which would enable a skilled worker to resort to Kotzur, and, as a practical matter, there is no way in which the disclosure of Kotzur could be incorporated into Hebberling, at least without resort to further invention. Where does Examiner propose to include the electronic controls in the Hebberling construction? Of what practical use would be the electronic controls of Kotzur where Hebberling uses only a single motor?

Examiner has rejected claims 3 to 5 under Section 103(a) as being unpatentable over Hebberling in view of Benya. Examiner has explained that Hebberling, as set forth above, does not disclose feeding the linear flexible product coaxially with respect to a pivot axis of said traverse arm with a guiding means adjacent said free end of the traverse arm. Benya discloses a device for traversing a linear flexible product, including a pivotally-mounted traverse arm (18), a rotating motor (not shown) a link that includes a cam (24) and fly wheel (32) interconnecting a rotating part of said motor with a point on said traversing arm (18), a means (21) on said arm (18) for receiving said product along a path of motion substantially coaxial with respect to the pivot axis of said arm (18), and a guide means (20) on said arm for guiding said product to a point of discharge adjacent said spool. Benya teaches the feeding of the flexible product coaxially with respect to a pivot axis and guide means adjacent said free end. He concludes that it would have been obvious to one of ordinary skill in the

art to feed the flexible element of Hebberling coaxially with respect to the pivot axis and provide a guide means adjacent the free end of the traverse arm to provide a compact winding device as taught by Benya.

In response, it is submitted that Benya relates to a completely non-analogous art (winding of an anchor chain), but it is to be appreciated that Applicant is no longer claiming the teaching of Benya independently of the combination of new claim 9.

Applicant believes that Kotzur does show a computerized control of certain elements of his device. His device is for the enabling of continuous winding of filament material without substantial interruption from one spool to another, and he does not use a traverse arm as taught by Hebberling, but rather, shifts a sliding device to position the filament for flow from one location to another. From the standpoint of anticipation, he does have a disclosure in column 15, which suggests controlling the speed of his winding motors relative to traverse speed. However, as clearly indicated in Figure 4 of Kotzur, and column 7, lines 9, et seq., he does not use a traverse arm, but rather, a guide 25, which moves along a rectilinear axis. He employs a cam (e.g. mechanical means) in accordance with Table 1 (column 8), and control of the guide is substantially predetermined. He does suggest the control of the mandrel motor speed to bring it in accordance with the predetermined path of the guide 25. Stated differently, he does not provide for varying the traverse of the filament guide at all, but suggest that the speed of the spindle may be varied to bring it in accordance with the movement of the guide.

By contrast, Applicant, through his program, predetermines where the pivotally-mounted guiding arm should be at any instant, and compares it with where the arm actually is at the same instant through the use of polar coordinates. If the two points do not coincide, the motor guiding the traverse arm is accordingly adjusted. Such a procedure enables the use of the same device for winding spools of different axial length, in which case, it is not yet necessary to use the entire traverse arc of the pivotally-mounted guide arm. By contrast, Kotzur and Hebberling are both constrained to use a uniformly sized spool.

It is believed that a rereading of Applicant's disclosure with the above discussion in mind will enable Examiner to appreciate the scope of the present invention, and better appreciate what Applicant is doing. While the particular way in which Applicant accomplishes his objective is, at the present time, Applicant's "best mode", it is entirely reasonable to presume that the same objective can be obtained by other variations independently conceived without resort to Hebberling or Kotzur. It is for this reason that Applicant's claims are presented as a combination of means plus function which is permissible under Section 112.

To summarize, Applicant's invention lies in the implementation of the concept of deciding in advance where the traverse arm should be in accordance with the particular spool being wound, e.g. predetermining how much of the possible traverse of the arm is needed and monitoring the path of movement of the traverse arm in accordance therewith. This concept is entirely independent of monitoring the spindle drive motor which must rotate a given number of revolutions for each layer wound, and must be directed to stop when the winding of the spool is completed.

The newly presented claims which replace the initially presented claims (except for claim 5), should be reconsidered in the light of the above discussion. If Examiner believes that prosecution will be expedited by a telephone interview, counsel is available weekdays, 9 a.m. to 5 p.m. at 203-227-7368.

Further and favorable action is earnestly solicited.

Respectfully,



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